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Information Sources on Twitter

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>> I bet that you stayed here now because my name is on the program that's because you set your Facebook app to say I'm a loser. If [inaudible] automatically on your Facebook if you leave. But--thank you, thank you, thank you. So I'll try to--I thought to myself throughout the day, if I'm blessed, how I'm going to do it in a way that it's still keep everybody involved and it came down to not asking you to read it too much. So, we'll try to do it in pictures as much as I can. So, yeah, and that's not Excel, so we get to that. There is a port. So, how it all started? I did my master's back in the field of university about analysis of code of ethics. We had nothing to do with social media. And--But I did [inaudible] internet or website stuff and where they move too many so tough from appear to this program, I was like we need something new. And a very good friend who was a molecular biologist that said networks are cool. That probably something there in social science you can do is networks, and I really had no idea. So I--and although there was 40 years of--40 years of more literature and sociology on social networks I knew nothing about, my only knowledge about networks came from my friend and all the--out because of what they use to call then, the bible of networks, this is 150 pages article that make human--human posters like six, seven, ten years ago. So that which was--much as I knew. [Inaudible] why will you establish link? So I was sitting at the bank at the riverbed, that's the Mississippi at the University of Minnesota and waiting. It was early 2003, school almost started, that's why I figure out what I'm doing, and I was within it. In one point I started reading, and by the way, do you know what's the difference between these two photos down there? Anyone? [Inaudible Remarks] 20 years. So I was with the respect about the network effect of the 1977, I think, blackout on the East Coast. And I came home staying with not even home. I didn't have a place at Minnesota. I just stayed with family friends and log in to the dial-up to cnn.com and it was early September 2003 which is the other photo, and I thought to myself, "That's weird, I'm just reading if all this blackout, the network effect, then I'm just coming home and there is a blackout in the East Coast." I told myself, "Maybe it's a good sign." So school started, I tried to think, okay, communication, networks, and one of the very first classes I took, I really wanted to study online dating sites. I was new in a new city, looking for love, news website or dating website were awesome. I really want a class project. But the instructor, the professor of this class said you have to walk in groups. I was like, okay. Mid-semester, that project almost done, I went in, then I learned my very first lesson, work with a computer scientist if you don't know how to program. So I had a fair grade, not the first student at that class. And Shawn [phonetic] and he want the [inaudible] once think, I won't do the other things. Somewhere in the middle, we decided to study news groups, political news groups as network, in fact every place. And, you know, 2006, that's pretty much what we had when it comes to social media. So we started working it, and then I learned the second great lesson, and this was the first semester, [inaudible]. Lots of good things happens, just coincidence, you don't plan it, you don't try it. You just have to do it. And hey, it end up being a good thing. [Inaudible] things presented in the paper and social networks conference, which where I met Mark. And Mark said, "Do you want data?" And I said, [inaudible] research a couple--couple of years later, working on the nets in that, what they had over there, where Mark was the director of the team. And there was a--it was a great experience that all out or firsts. First, the very first huge data sense, [inaudible] you analyze what was it before. Code of ethics for you master, these aren't really much--lots of data are going on. And even when we've collected a few news groups and Google was keep flagging us and were blocking out data, so having access to this great data or my colleague, this notation in the box, was very interesting and fascinating and exciting, but also brought lots of one of the great challenges that started there is that we have so much data, how do we make sense of it, but not only in the statistical, analytical way, but how to make sense of it in the conceptual theoretically, especially when

it comes to communication studies, we have quite few good people doing network analysis, but it's really not a major theme of analysis. And since then, every--it's challenging every piece of publishing and that--which coming from political communication and expand a little of [inaudible], public relations, [inaudible] games talk on Tweekter. Weird things happen when you tell your colleagues, I have data. So, that's one of the challenges that seems they're trying to figure out because the data is getting old by the time it's published, unless you make it theoretical--theoretical contribution, it's really hard to sell your data. The other fun thing happened there is this little application to study [inaudible], later became known Excel which was interesting because for a really long time, network analysis was first it never really gave you the data that was just importing. And while they became really, really evolved application, network analysis was really hard to use.

[Pause]

And political communication was the context of the study. So it was--coming from communication research, and we're coming from a place where--so my question comes from what's going on around me, news--tradition news media decline. Alternative information sources rise, new parts of a new competition. Tradition news media trying to--starts to--or media organization try to use social media mainly because everybody is there but not completely sure how to do it. Whether they're successful, what is success, and how to measure this kind of interaction? And I was merely--mostly fascinated that here for most social perspective, I mean, communication and fragments, we got to the place where everybody are users. If in the New York Times, you're a user. If you are the president, you're a user. If you're [inaudible]--they're all user, so what happened at all these very different users interact? So the early work, as I said, was in political news groups, we looked at the networks of news groups users and replies the network. We had lots of--six months was part of--it actually was six years there of political and health conversations. This specific paper later on published as the discussion catalyst piece, has a 20 political news groups. And we find out that the idea of information--information searching, exposure, happens in different ways. You reply to people you interact, you respond to messages, you post hyperlinks. We find out that what is expected when you know that all networks have organized that puts together power law. But, you know, from a communication perspective, it was fascinating to see that 2 percent of thread start has attracted more than 50 percent of the replies. And when they talked about these people that started this successful, this 2 percent that started successful threads, 95 percent of them posted their link, 2/3 of them to traditional news media. Rather to the context that yes, it's whole new world of network and user interaction, and so on. But ultimately, people, at least, there was a large percentages appreciating people who bring information from elsewhere. And most of became from traditional, credible, well, more or less, news media. I just put it here, not because it's nice and green and pretty, but because it will change. It was--it was interesting to look that almost a quarter of them come from blogs and personal and user-generated content, but we see that overall over the years did this part expands in the news media shrink for variety of reasons including the fact that there are more sources available that provide that kind of information. By the way, just as a point, every time I bring something that come from article and process published accepted to any of these things, there'd be a little information down there so you know where it's coming from after all academics. So that was early work and I start to figure out, okay, what I am just--what's the [inaudible] of questions that I have. So, I already started talking about that so we know there's unequal distribution, long-term, you name it. And so, creating new hubs. So, it was pretty--predefined [inaudible] hubs and pre-internet, pre-social media function, news organization, politicians, and so on. But now, who is becoming--who are becoming the hubs, there're the central people in the network. So just one question I was interested in. There's a lot of excitement about social media as the greater goal where everybody come and meet in discussion, express or exchange opinion and ideas. And several questions I had regarding that. First, how and do we share information sources with one another? Do we actually interact? In self exposure and, you know, we all participate in exercise, self exposure, actually means selective exposure. Other question I find interest were how do we select information socials and social media? We have a wide range of information source that

you can choose from, from traditional media for newer types of news media, from sources for information health, political organizations think tanks, local media organization. User generator, like a patch mix of user and professional news media, politicians, you name it, how do we select that we can identify some patterns in information selection? So much of the work that I've done in the last couple of weeks was related to communication networks on Twitter. Fill this definition, you all know what Twitter is. The way I see Twitter is a network of self exposure. That's how I conceptualized it because every time you follow someone, you select to expose yourself to their content, you subscribe. Now, it doesn't mean you read it. Anyone has more than ten people they follow in Twitter means that, you know, it doesn't mean you mean. But anyone who ever had a subscription to a newspaper knows that it doesn't mean you read it, that we subscribe to it. But it's not at higher threshold, but at least make--tell us something that you make some conscious decision to follow and expose yourself to that person's content.

[Pause]

So, there you have several equations over there. First was like at the very basic level, who are the big dogs? The University of Georgia Dawgs, who let the dogs out, you know, can't we, please spell it D-A-W-G-S. Okay. We find some national work in our [inaudible], Birds of a Feather, tweet together. And so, by the way, another fun thing about working with Twitter, here comes really fun names for articles. [Inaudible] but really makes the turnout of fun. We find out--remember the 25 percent we had news groups around them mid-2000s? Well, you can see that that part is [inaudible] the individual and small groups. National topics which we have there as well. Traditional media also remain over there, online news only about 20 percent--whatever is governmental website a small percentage, but it also makes sense because sheer numbers wise, we have less of them. Interesting that regardless, we still see that in the context of is news media going to die? No, but they may have to adjust themselves to a changing environment. Find out when they play a role, active role, on social media. They are gaining or regaining their position as information sources. When we look at local elections with [inaudible] and others playing in the same Twitter field, yeah, we find out that, yes, Grassroots still play a role, but also local media versus national media as well.

[Pause]

So it was nice and pretty simple to identify that people use the hubs in a higher degree. Some mythological challenges of defining, okay, what is high in the drop and the thresholds. But overall, was interesting, some who didn't think insights, but it would--we really felt that, I already felt, that it doesn't really give us the social context of the conversation. So the next time is what I like to cook contradicting context. If you're going to search for the healthcare, same sex marriage, any politically hot controversial topic on Twitter, you're going to find out the people are--some people support it, some people against it, some people draw it from tradition, from credible sources, others draw from less credible sources, and so on, and some offensive, other are polite. Find out a wide range of--type of people in content. What--How did we look in a social media without considering the social aspect of social media, might missing something. So, when we started doing with many--much of this research is before actually looking for the big dots, [inaudible] we--let's first--we first start mapping who follows whom. The context of the conversations, the clusters that are created. And yes, you always find clusters. You know why you always find clusters? Because you run an algorithm that tells you have to find the cluster and it will find cluster because that's what the algorithm is doing. But--And that's where affirmation they're trying to figure out if these clusters are meaningful. Modularity, is one way to go with it. Too excited and you find out that clusters are meaningfully separate and distinct for one another, we start looking at different aspects of this conversation, sub-conversations. So Birds of a Feather, we look about 10 different topics while the 2010 midterm elections, learn lots of valuable methodological aspects. For example, if you say global warming, you get the conservative, and if you say climate change, you get the liberals. So, [inaudible] to be really careful when you choose the keywords to connect the data here. But overall, we find out having these blue red clusters that you see

across many national topics, liberal talks to liberals, conservatives talk to conservatives. When it's--we started speaking about back to hubs, the high and the most connected people, we'd like to--okay, it's not really as meaningful to find out who are the most connected people in the entire network, but within these specific clusters. And we find out that across different networks topics, in time, quite interesting findings--the field. We find out that when it come to, well obviously, red and black, red and black again. It is [inaudible] will have to--yeah, red and blue clusters. Red, the conservative clusters tend to be more denser, more interact--more interconnected, the more liberal cluster. Find out also across many topics that conservative--the conservative cluster users tend to draw primarily--the hubs tend to be opinionated, clearly opinionated information sources, the [inaudible] rated bloggers, televisions host, and so on, while the liberal tend to be a mix of liberally link sources and traditional media. That's State of Union 2012 [inaudible]--what, still open, and will be called tweetting apart. Thank you Mark. When we looked at--and then--yes? And we also looked at--with Derick on the gubernatorial elections in four different states, and we found out that while in the national level, we have this right to left liberal facility, red and blue clusters. On the local level, they tend to have different characteristics of these clusters. One would be the local clusters, people that interact and interested in the local aspects of the elections so they mixed local news organizations, candidates, political activists, and so on. That's down here. The left of that, they tend to be much more interconnected, and a group of people interested in the more national aspects. So we chose the toss up elections. So we have some national interests as well while the findings are not as surprising. What it does indicate is again, the competition. We don't see as much competition of new types of user-generated, blog-based political websites in the local level as much as we see at the national level. And if you read the few most recent, the state of the news media reports from [inaudible], you find out that indeed the local level, especially television, newspapers are much--not much of a problems, but especially TV--local TV station is one of the very few types of whether they still don't dwell. And I think in part, the lack of competition so far with Grassroots News organization might explain some of it.

[Pause]

The method here of curving a topic network, identifying clusters if exists and find out hubs and other characteristics of tweets, hyperlinks, and users in each cluster is not applicable only for political communication, usually it's project you walk on cancer talk on Tweeter to identify--and who's very helpful as to identify the different community or sub-communities that discuss the topic, specifically found the co-communities and the visiting community. The co-communities people that talk about specific topic here, it was prostate cancer every week. The visiting group is like--they talk about it when the favored news media they follow talk about it. They start the conversation, will die or their favorite celebrity and so on which we found particularly important if you try to design specific messages if--for groups of people that the specific cancer is personally important, involved in the conversation, the type of message you want to design probably going to be someone different than people that are interested in this topic in much broader way and together with many other issues, health and other issues that they care about so different communities post different messages. So mapping these communities we found to be interesting as well that was breast cancer, the community down here is our co-community. These people appear, week after week after week after week. Other like [inaudible]--the conversation, [inaudible] rustyrockets which are here to--Wikipedia because I have no idea what that is, I am embarrassed to say. Again, different groups, won't they just love the celebrity so if they say something, they repeat it. Have a little conversation and they forget all about it and they [inaudible] of using cluster analysis to identify sub-communities. Different groups of people talking about the same topic on Tweeter, we found very helpful here as well.

[Pause]

Within cluster some of the things we found interesting to look at, to identify the conversation was to most--find the people most mentioned, most replied, the analysis of the hyperlinks, what about hyperlinks you ask

yourself, well, good question. So, about 50 percent, I think, on average of tweets actually using the hyperlinks, just makes a lot of sense because it always [inaudible] and say 140 characters. One way to identify the context and the content of a conversation is ask yourself, okay, where do people get information from, and where they sent people to get information from? For a long time, we'll just look at the hyperlinks to find out where they come and do the basic handed content analysis where hyperlinks are going to and the stories is wonderful and important. Another automated approach to it is looking at domains. So we looked at clusters and found out in each cluster, okay, where the hubs are, maybe political and other cumulated orientation of the message and the other thing that rely to information sources is where do they send hyperlinks to. So when you're ready to the 2012 State of the Union, found out that the blue cluster was sent--the talk domain they sent to was the International Justice Mission and the Barack Obama. And the red cluster the national. If you--and Common American Journal that brief look and see that the word patriotic appears a lot on the webpage which suggest something about the political orientation of the website. Again, all several ways that you can go ahead and identify different conversation based on the different aspects and characteristics of users and their activity. And of course world networks so just thought briefly about it, this--we were talking about it [inaudible]--there is a hidden network in the--any data collection you get from Tweekter which is the [inaudible] of words, it's called [inaudible] in tweets. Again, if you want to learn something more about the context of the conversation without going through thousands and thousands of content analysis of tweets is looking through the networks of words appearing on Tweekter. That was Michele Bachmann in 2011 if you recall she gave--[inaudible]--yes, she gave a conversation about--something about that the founding fathers fiercely objected slavery which create a lot of buzz and one thing we find out when we map this network of keywords, of words bite it by the clusters. So the blue lines are words that co-appear in the blue cluster, and the red lines are words that's co-appear in the red cluster because certain clusters also gives you the different type of conservation that happens within at least themes of conversation that appear in different--among different groups of people. Okay, so let's conclude. How are we doing time-wise? [Inaudible Remark] Thank you. So [inaudible] in some tips. So-- [Inaudible Remark] Yeah, it's like a dirt on a [inaudible], I think, isn't it?

[Pause]

So [inaudible] information sources was that if when you approach content on Tweekter, the three aspects that I like looking at. One is the use of description, second, is the content of the tweet, and third is the hyperlink. You have things about users as information sources in conceptualizing Tweekter network as a network of self-exposure uses our information sources. Each of these could tell you something about the kinds of information the people are subscribed to. Okay, words, probably it's not so many but what you're going to do. Addressing so--addressing issues of not as a self-exposure but selective exposure to find out that this methodological process helpful to making at least initial sense of many--of conversational Tweekter in a wide range of topics whether [inaudible] health communication, political communication, gamer talks, public--you name it, okay. I found that this process doesn't really gets you to the beginning to end in a paper, but really gives you a way to examine data sets and gets some insights that help you organize and understanding the conversation. First, we get the topic network for the keyword [inaudible] Excel and other data. Second, around the cluster as it's find--do we have a subgroups of users that interact with one another more than others and do these subgroups are meaningfully different from one another? Hence, check from [inaudible]. Identify hubs by cluster, analyze tweets by cluster. Everything you see here is again-- [inaudible] Excel is doing mathematically, the reorder and domain that [inaudible] mentioned to replies to--reply to. Don't forget the other network, the words pair of networks. Again, for who? For the entire network and by cluster, to examine themes and conversation and on the people participate in that topic. Tweekter is a network of self-exposure, allow us to map the network and identify the major sources, to cluster by hub and characterize by the different characteristics. I think I'm just repeating what I've said in the previous but nobody will notice because it's almost the end of the day. [Inaudible Remark] But you know when you stayed in class, you'll make something weird on the PowerPoint and just say I just want to

see if you are awoken and paying attention so that's [inaudible] for now. Oh, people talked about IOB. I thought it has nothing to do with what I touched so far. But trying to mention it because I think I can with the formula. So, with the first [inaudible], I want to do analysis of the Tweeter data they collect. It's publicly available, I say, don't worry, and they said, "Can you contact something in Tweeter and ask them to permission to use the data?" And I said, "We need to meet." Lucky enough, a colleague, his wife used to be the head of IOB. She said, "Okay, we need to meet." Two things you need to know about IOB which got to exist in data. They for--they're supposed to follow the law. One in fact is they quite often trying to cover all the possible basis. The human subject act or something along these lines indicates very clearly that if data sets--first, publicly available, B, people that information is out there should not have expectation of privacy. It's not--this content is not considered human subjects. If it's not human subject, it doesn't fall under the Human Subject Act and therefore not under the IOB's jurisdiction. There's a hidden form for most IOBs that often you will not find on the website called the nonhuman subjects form. They will send it to you. I went for the same persons from the Tweeter, for YouTube and networks, and for the public pages of--public pages on Facebook because I teach the classes analysis three weeks. If we need to go to IOB, my graduate students cannot complete the paper and publish it. So, I have this done before class, just give them the names. They--what I did I make the argument it's publicly available which it is. I went to the statements of terms of condition and privacy and all three will say, believe it or not, if you make it public, it's public. And it's a beautiful sentence because if you--that shows when they click, I agree, they have no expectation of privacy because they agreed that if they make it public, it's public. While it sounds stupid, it's helpful. And that's pretty much I was able to go to IOB, they pretty much told me we don't need [inaudible] anymore. When it comes to--and that's very helpful for my research and very helpful when I work [inaudible] students and we run projects in class. So if there's no expectation of privacy and if they [inaudible] publicly available, IOB should approve it as nonhuman subject, a project with such a lot of time, travel, and mental well-being. Questions?

[Applause]

Thank you. Please. [Inaudible Remark] Yup.

>> And wondering if there was a quick relation [inaudible] for this?

>> Yes. [Inaudible Remark] No.

>> It depends.

>> What--Well, at least I'm not familiar. You can edit the, you can add in the stock list and add more words. For me, one of the great important things to add is the keyword that I used to collect the data, I mean, that's basic than that because it will not be there. So yes, and that you can do it quite easily. You can--when it comes to, you can run any--not--correct me I'm wrong here, but you can write any of the network analysis procedures. You can write on the social networks, on the work networks. So characteristics of specific nodes, relationships, density, clusters, all these things, you can run, everything through our social [inaudible] networks more advanced, words, modeling, I don't think so, right? Yeah, sure. Yeah.

>> I wanted just to hear more about how you're doing [inaudible] analysis?

>> Okay.

>> Just how you're defining the original domain?

>> So that's actually something that we just finished figured out in the next couple of weeks, next couple weeks. So you get a short URL and so it needs to go to the [inaudible] expended it, where you download the data, you asked you--do you want to expand the URLs. If you click Yes, it takes a little more time, but they need the expense the URLs to do most of the time for the original one, depend how many times that were compressed, exactly. And it will con--first it will show you the original in the spreadsheet and counts the top hyperlinks in general and by cluster. The next step it can do, if you want, it will chop it to the domain because for me domain being like cnn.com or newyorktimes.com. And the reason I was particularly interested in that is that, first, the frequencies will be much higher and therefore more meaningful because this [inaudible] only five times, a URL will co-appear in a data set. And the reason they appear many times probably because they really tweeted a lot. Now if you chop it down to the domain, you can learn more about hyperlinks used as reference to the type of information sources in general. So if one gets a lot of one clusters, talk about immigrants, immigration people primarily look for all kind of nonprofit, and advocacy, human rights, civil rights organization. And then others will go primarily to conservative blog as in Fox News. So there might be very lots of specific stories there. But chopping down to the domain actually tells you more about the kind of sources to join from. Does that answer your question?

>> Yeah. Awesome.

>> Yes

>> Going back to your selective exposure [inaudible] can we just--you were telling whether you have a conclusion about whether people are getting selective exposure?

>> Yes, first of all, I'll define the selective exposure in one [inaudible] primarily, selective exposure in the contents of political--in terms of politically biased-oriented information sources. So I can tell what you--we find across time and the interpretation of whether it's selective or not or may I guess its interpretation. We definitely see that the conservative users in quite a few networks of political--[inaudible] political talk, we find out [inaudible] primarily from--clearly a self-defined or identified conservative sources when it comes to hubs. With liberal we see, it depends. If it's a hot topic, that's news, media talk about it, we'll see a mix of what we call mainstream media, you conservative may call it a liberal media but what we usually see as mainstream media in political either pundits or columnist on newspapers and so on. If it's not in the news, you will find out that the liberal clusters tend to draw for primarily informations sources that are more liberally oriented bloggers and others simply because it's not in the conversation [inaudible].

[Inaudible Remark]

Well, and of course, that's always the question and you hear it a lot is that no matter what happened, you'll be more exposed to more sources of information online than offline. As a mass communication scholar, I always compare it to pre-internet days, to pre-internet days.

>> Yeah.

>> 9--86--80 to 85 percent of Americas watching one of the three major news broadcast in the evening. Today, I don't know what to compare it to, obviously. TV, I think we have something from [inaudible] suggests that we have similar pretends over there. However if you feel--that's actually a piece that I read or [inaudible]. Recently suggested that's still the major network news sources still gaining much of attentions from the public. [Inaudible] if we make this--if we--to agree that they provide some of the more balanced news coverage so they may get it from their--as well. So, I think if we compare it to the TV for example, my sense, I haven't studied myself, it probably get more often diverse source of information, but the question is what do you compare it to, which I'm not sure going to answer. What would you compare it to?

>> Neighbors.

>> Okay.

>> I don't know, it's--some by fictitious alternative of a--what we could have agreed turned out via the network.

>> A random model. [laughs] Yeah, I don't--it's hard to find a baseline these days but that's methodologically and conceptually I guess will be the case, right? Yeah, please.

>> Sir, I have another question just introduce [inaudible] exposure and how we understand it. I mean, if a user, how are you defining--my understanding such an exposure is that you tend to seek out the sources that are consistent with reviews. How do you know that someone is a liberal or forgetting who they're following because I don't necessarily [inaudible] that. So I mean, I know that that's an argument but, this idea that, you know, if you're following--but if you're following Obama and Romney that makes sense. So there's a problem, right, but in terms of how your operation [inaudible].

>> Oh, it's wonderful. It's not the problem if you follow both of them [inaudible].

>> Right, okay, sorry, yes, we're sort of--that's sort of important. But nevertheless, you do have to identify, you do have to [inaudible], right, blogger to do this. So do you have thoughts on that?

>> So let me--we [inaudible] on this thing, good question. You're asking how do I know if they--oh, do I know that-- [Multiple Speakers] Do I know the user's political orientation? In the first paper, that's what we did. In the Birds of a Feather, we went all--[inaudible] analysis of all that. Now it's obviously statistics. I mean, it's still the 100 percent of the forum. But we find out the vast majority in each cluster where either showed [inaudible]. In most of the topics we examined, we find out that in this clusters, we had in one cluster, the vast majority were expressed one way or another either to the tweets, all the self-description, conservative orientation, or liberal orientation in the other cluster. Some profits did not--things that I'm trying to [inaudible] in mind, but we find out that some topic are more information-based, so people would not necessarily expressing strong political orientation but it just wanted to deliver in about a topic. But the more controversial the topic is, the more [inaudible]. So Birds of a Feather we actually looked. So we did it on the exam [inaudible] selective exposure, we also examined a law firm, people trying to interact [inaudible] like-minded people about [inaudible]. The most--in the recent--the most recent site [inaudible] published it, we didn't really went manually content analysis of all the tweets in each cluster but we use some of the automated options we have there which associate to [inaudible] the height of [inaudible] the link that they post. And the major sources of information in this cluster. So we did [inaudible].

>> Yeah, I think, I think I understand.

>> Yeah, in some [inaudible], we need to examine all the tweets to find out that, hey, all of these people are conservative people and conservatives and most people, you know, are liberal [inaudible] interested in major source of informations. So we did it.

>> Okay.

>> Okay.

[Pause]

All right. Thank you so much people. [Inaudible Remark]

[Applause]